causes the computing device to perform a method(s) as may be recited in one or more accompanying claims defining the disclosed subject matter. The tangible machine readable medium may include storage of the executable software program code/instructions and data in various tangible locations, including for example ROM, volatile RAM, non-volatile memory and/or cache. Portions of this program software code/instructions and/or data may be stored in any one of these storage devices. Further, the program software code/instructions can be obtained from remote storage, including, e.g., through centralized servers or peer to peer networks and the like. Different portions of the software program code/instructions and data can be obtained at different times and in different communication sessions or in a same communication session.

The software program code/instructions and data can be obtained in their entirety prior to the execution of a respective software application by the computing device. Alternatively, portions of the software program code/instructions and data can be obtained dynamically, e.g., just in time, when needed for execution. Alternatively, some combination of these ways of obtaining the software program code/instructions and data may occur, e.g., for different applications, components, programs, objects, modules, routines or other sequences of instructions or organization of sequences of instructions, by way of example. Thus, it is not required that the data and instructions be on a single machine readable medium in entirety at any particular instance of time.

In general, a tangible machine readable medium includes any tangible mechanism that provides (i.e., stores) information in a form accessible by a machine (i.e., a computing device, which may be included, e.g., in a communication device, a network device, a personal digital assistant, a mobile communication device, whether or not able to download and run applications from the communication network, such as the Internet, e.g., an I-phone, Blackberry, Droid or the like, a manufacturing tool, or any other device including a computing device, comprising one or more data processors, etc.

Although these teachings have been described with respect to various embodiments, it should be realized these teachings is also capable of a wide variety of further and other embodiments within the spirit and scope of the appended claims.

What is claimed is:

1. A computer implemented method for discriminating between atrial fibrillation and premature ventricular contractions (PVC) and premature atrial contractions (PACs), the method comprising:

demarcating boundaries in a Poincare plot space, the boundaries being obtained from data from a test set of test subjects; the Poincare plot space being a space of time interval between consecutive pulses obtained by sensing variability in heart rate signal;

constructing a Poincare plot of time interval data from a subject under test; the time interval being a time interval between consecutive pulses obtained by sensing variability in heart rate signal from the subject under test;

identifying data in patterns in the Poincare plot, the patterns including patterns corresponding to combinations of at least one of bigeminy, trigemini, and quadragemini indicating one of PAC or PVC;

obtaining updated data by subtracting the data in the patterns corresponding to combinations of at least one of bigeminy, trigemini, quadragemini indicating one of PAC or PVC from the time interval data from the subject under test;

obtaining a root mean squared of successive differences, a Shannon entropy and a turning point ratio for the updated data;

comparing the root mean square of successive differences to a first predetermined threshold; comparing the Shannon entropy to a second predetermined threshold;

comparing the turning point ratio to a third predetermined threshold;

determining, if each of the root mean square of successive differences, the Shannon entropy, and the turning point ratio is not less than a corresponding predetermined threshold, that the subject under test has atrial fibrillation; and

determining, if each of the root mean square of successive differences, the Shannon entropy, and the turning point ratio is less than a corresponding predetermined threshold, that the subject under test has normal sinus rhythm (NSR) with PVC or PAC;

wherein demarcating boundaries in a Poincare plot space, constructing a Poincare plot, identifying data in patterns in the Poincare plot, obtain updated data, obtaining root mean squared of successive differences, Shannon entropy and turning point ratio for the updated data, comparing to predetermined thresholds, and determining whether the subject under test has atrial fibrillation or the subject under test has normal sinus rhythm (NSR) with PVC or PAC are performed by one or more processors executing computer readable code embodied in non-transitory computer usable media.

2. The computer implemented method of claim **1** wherein the determining that the subject under test has normal sinus rhythm (NSR) with PVC or PAC comprises:

constructing a first probability distribution for peak amplitude data from the subject under test;

obtaining a first Kullback-Leibler divergence for a second probability distribution and the first probability distribution; the second probability distribution being constructed from peak amplitude data for another test set of subjects with PAC;

obtaining a second Kullback-Leibler divergence for a third probability distribution and the first probability distribution; the third probability distribution being constructed from peak amplitude data for yet another test set of subjects with PVC;

determining that the subject under test has NSR with PAC if the first Kullback-Leibler divergence is greater than the second Kullback-Leibler divergence; and

determining that the subject under test has NSR with PVC if the first Kullback-Leibler divergence is at most equal to the second Kullback-Leibler divergence.

3. The computer implemented method of claim **2** further comprising determining whether a PAC or PVC pattern is quadrigeminy pattern, by:

identifying whether repeating pulse interval patterns are "short-short-long-short-short" (SSLSS) patterns;

determining a number of turning points in identified SSLSS patterns;

determining an expected number of turning points by a predetermined relation; comparing a difference between the number of turning points and the expected number of turning points to a fourth predetermined threshold; and

determining, if the difference is greater than the fourth predetermined threshold, that the PAC or PVC pattern is a quadrigeminy pattern.

4. The computer implemented method of claim **2** further comprising determining whether a PAC or PVC pattern is trigeminy pattern, by:

identifying whether repeating pulse interval patterns are "short-long short" (SLS) or "long-short-long" (LSL) patterns;

determining a number of turning points in identified patterns;